

**SUBJECT: USING TRAFFIC CONES TO PREVENT AGV COLLISIONS**

When working in or around the AGV guide path, precautions must be taken to prevent injury or damage from AGV collisions. Normally, collisions are prevented by the Vehicle System Manager (VSM) computer which tracks all AGV movement. However, while an AGV is under manual pendant control or has been disabled/faulted in the normal guide path, the VSM tracking is disabled. During this time, the operator is in complete control of the AGV and must take precautions to prevent collisions and accidental contact.

**Safely Inserting AGVs into an Active System.**

- Caution must be exercised when inserting an AGV into an active system. Failure to do so may result in injury, damage to AGV components, and downtime. Refer to the system maintenance / instruction manual for complete insertion procedures.
- The use of traffic cones will reduce the possibility of collision during insertion. The laser bumpers on the front and rear of each vehicle will detect an AGV or a traffic cone but may not detect raised lift forks.
- During the insertion procedure, the VSM computer does not track the new AGV. By placing a traffic cone in the guide path, an approaching VSM controlled AGV will detect the cone and stop.
- Cones should also be placed in the oncoming guide path, both in front of and behind the vehicle being inserted. (See Figure 1)

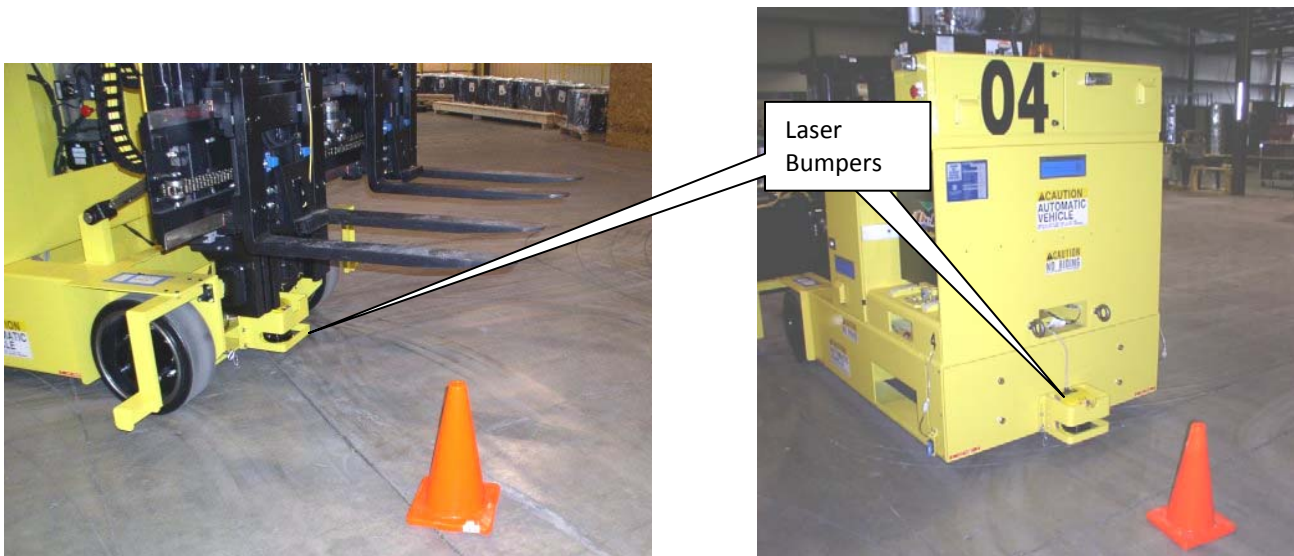


Figure 1: Illustrating proper traffic cone placement.



Figure 2: The traffic cone placed to the rear of the AGV under pendent control reduces the possibility of a collision by the approaching AGV.

## 2. Safely Working in the AGV Guide Path Area

- Traffic cones must be placed on the AGV guide path when work is being performed on or near the path.
- Traffic cones reduce the possibility of collision when placed between the AGV and a maintenance stand, ladder or man-lift. See Figure 3.
- Maintenance personal should always work with a safety person on the ground. The traffic cones cannot replace the ground safety person.



Figure 3: Illustrating proper traffic cone placement.

### 3. Safely Working in Trailers or Warehouse/Staging/Storage Areas

- Prior to entering a storage aisle or trailer that is being serviced by an AGV, the operator must disable the aisle or trailer at the VSM (Vehicle System Manager) or the PWM (Plant Warehouse Manager) computer.
- Traffic cones should also be used as a backup method to stop an AGV from entering the aisle or trailer. Placing a traffic cone on the guide path at the entrance to an aisle or trailer provides additional protection against an AGV entering the area.

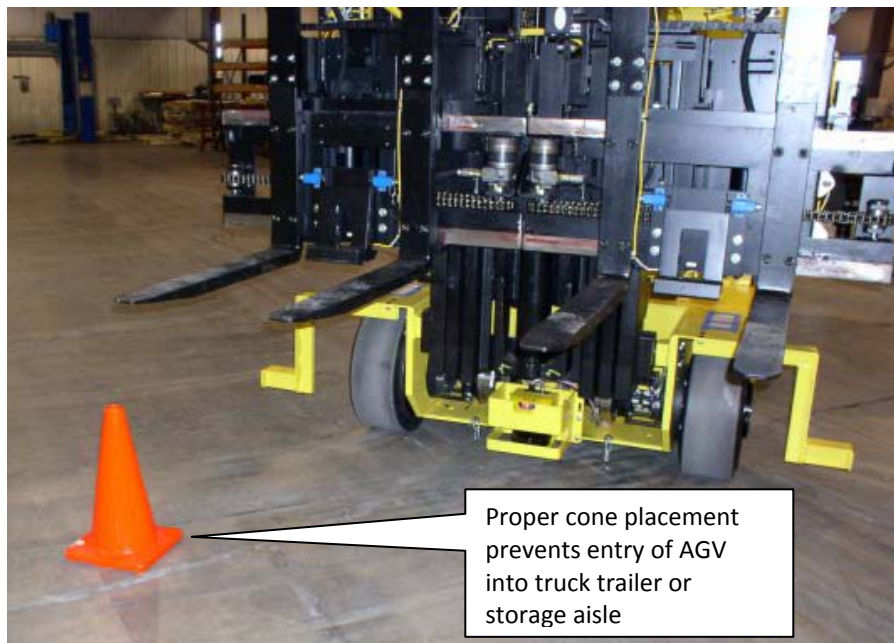


Figure 4: Illustrating proper traffic cone placement.



#### 4. Safely Working in Multiple Guide Path Areas

- In an area where multiple vehicles may travel, Figure 5 shows how vehicles may interfere or make accidental contact. When vehicles are in automatic mode, the VSM prevents these conditions from occurring.

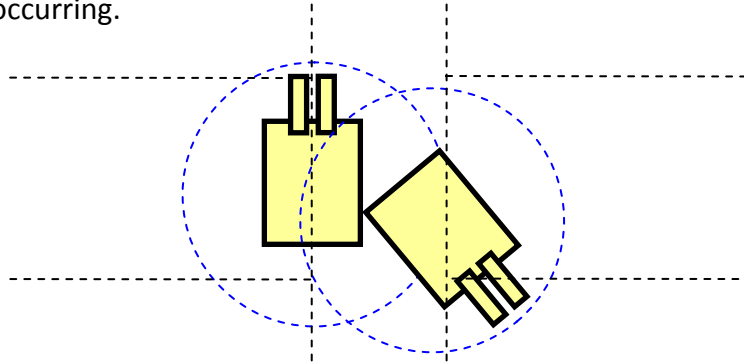


Figure 5

- When a vehicle is inoperable and/or not controlled by the VSM, the user must take care to block travel paths around the repair area to assure the work area is safe from traveling vehicles. See Figure 6.

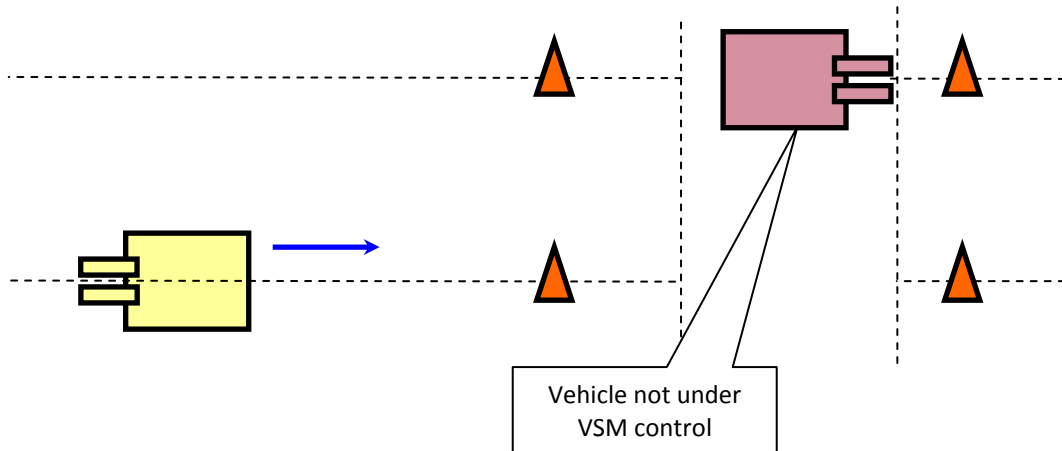


Figure 6